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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,082	06/25/2003	Zaiqian Hu	1200.652	1894

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EXAMINER

MCKINNON, TERRELL L

ART UNIT PAPER NUMBER

3743

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/603,082	Applicant(s) HU, ZAIQIAN
	Examiner Terrell L Mckinnon	Art Unit 3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 and 10-14 is/are rejected.
- 7) ☒ Claim(s) 4, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto et al. (U.S. 5,682,944).

Yamamoto discloses a heat exchanger comprising all of the applicant's claimed and disclosed limitations.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (U.S. 5,682,944) in view of Yamamoto et al. (U.S. 5,311,935).

Yamamoto's ('944) invention discloses all of the claimed limitations from above except for the core depth of the heat exchanger being between 6.0 and 27.00mm.

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5. However, Yamamoto teaches a heat exchanger having a core depth of between 6.0 and 27.00mm (column 3, lines 40-56).

Given the teachings of Yamamoto ('944), it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat exchanger of Yamamoto ('935) with a heat exchanger comprising a core depth between 6.0 and 27.00mm.

Doing so would provide a design requirement that will improve the heat exchangers performance for a given design environment.

6. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (U.S. 5,682,944) in view of Yamamoto et al. (U.S. 5,311,935).

Yamamoto ('944) discloses a heat exchanger comprising:

- a first end tank; a second end tank opposite the first end tank;
- a plurality of first tubes in fluid communication with the first and second end tanks, the plurality of first tubes adapted to have a first fluid flow therethrough, the plurality of first tubes each having a hydraulic diameter less than about 1.00 mm (column 3, lines 40-56 and column 5, lines 20-30);
- a plurality of second tubes in fluid communication with the first and second end tanks, the plurality of second tubes adapted to have the first fluid flow therethrough after the first fluid flows through the plurality of first tubes, the plurality of second tubes each has a hydraulic diameter less than about 1.00 mm;

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- at least one fin contacting least one of the plurality of first and second tubes, with the first and second tubes and fins being generally coplanar relative to each other.

Yamamoto's invention fails to disclose the fin height is less than or equal to 8.0mm.

7. However, Yamamoto ('935) teaches fins having a height is less than or equal to 8.0mm (column 4, lines 55-57).

Given the teachings of Yamamoto ('935), it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat exchanger of Yamamoto ('944) with fins having a height less than or equal to 8.0mm.

Doing so would provide a more efficient heat exchanger.

8. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohashi (JP 04-369396) in view of Yamamoto et al. (U.S. 5,682,944).

Ohashi discloses a heat exchanger comprising:

- a first end tank, a second end tank opposite the first end tank, a plurality of first tubes in fluid communication with the first and second end tanks;
- the plurality of first tubes, and plurality of second tubes are in fluid communication with the first and second end tanks, the plurality of second tubes are adapted to have the first fluid flow therethrough after the first fluid flows through the plurality of first tubes;
- one or a plurality of third tubes in fluid communication with the first

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and second end tank, the third tubes adapted to have a fluid flow therethrough and a plurality of fins disposed between the plurality of first and second tubes and the plurality of fins being generally coplanar relative to each other; and

- the third tube or plurality of tubes are above or below the first and second plurality of tubes.

Yamamoto's invention fails to disclose the plurality of first and second tubes having a hydraulic diameter less than about 1.00 mm.

9. However, Yamamoto teaches a plurality of first and second tubes having a hydraulic diameter less than about 1.00 mm (column 3, lines 42-45).

Given the teachings of Yamamoto, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat exchanger of Ohashi with a plurality of first and second tubes having a hydraulic diameter less than about 1.00 mm.

Doing so would provide a heat transfer tubes with enhanced heat transferring capability.

Allowable Subject Matter

10. Claims 4, 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited for disclosing related limitations of the applicant's claimed and disclosed invention. Tanaka, Marsais et al, Wollbeck et al, Marsais and Hughes et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L Mckinnon whose telephone number is 703-305-0059. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 308-0101. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L Mckinnon
Primary Examiner
Art Unit 3743
April 19, 2004